



UNIVERSITÀ DEGLI STUDI DI FERRARA

DIPARTIMENTO DI ECONOMIA ISTITUZIONI TERRITORIO

Corso Ercole I d'Este, 44 - 44100 Ferrara

Quaderno n. 12/2006

June 2006

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Quaderni deit

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Does finance matter in the re-specialization of Italy's industrial districts?

by

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June 12, 2006

Abstract

Once credited as the leading hedge of the Italian economy, industrial districts (IDs) are now often identified as the problem rather than the solution to Italy's stagnation. But we can observe a clearly better performance for IDs in mechanics, particularly in those showing signs of a vertical re-specialization, evolving from the production of final goods in the "made in Italy" tradition to the production of the related investment goods. We posit that this type of vertical re-specialization could offer Italy a way to upgrade its competitiveness.

Against such background, this paper evaluates whether, indeed, re-specialized firms are more innovative and whether there are any financial peculiarities behind the vertical re-specialization of the successful IDs. Specifically, producing capital rather than final goods supposedly calls for higher leverage and, in turn, for more relationship finance.

We test these hypotheses using data from the Capitalia survey focusing on firms producing capital goods for the most typical "made in Italy" final goods (food products; textiles and clothing; furnishings; leather & shoes, etc.). First, while we find no specific effect for generic ID firms, innovation is more likely for ID firms specializing in the production of capital goods for the "made in Italy" final goods. Second, we find that the more intense relationship lending – as measured by the length of the relationship between the firm and its main bank – the more likely firms make innovations and/or a high R&D expense intensity. Furthermore, we show that additional financial structure variables – e.g. belonging to a credit or export consortium; subscribing innovative financial instruments – have a positive impact on innovation and R&D expenditure. Third and most important here, the impact of relationship lending on innovation is stronger only for the ID firms specializing in the production of capital goods for the "made in Italy".

JEL Classification: G21, L25, L60, O30.

Keywords: industrial re-specialization, finance and innovation, industrial districts, relationship finance.

(*) We are the only responsible for the arguments and conclusions reached in the paper, which do not involve the institutions we belong to. We wish to thank Tony Riti for invaluable assistance. We are deeply grateful to Raoul Minetti for helpful discussion and for letting us use his database.

1. Introduction

In spite of their success lasting several decades, since the late 1990s the sentiment in Italy has turned negative on the countries' several Industrial Districts (IDs). For a long time, IDs attracted the interest of scholars as they seemed to offer the Italian economy its unique way to secure a solid position in the international arena. Notwithstanding the fact that Italy had come to rely on small-sized enterprises to the largest extent among industrialized nations IDs appeared to provide – through their positive spillover effects among member firms – a firm ground to keep the wide manufacturing base of the country competitive worldwide. However, over the last few years, IDs have been singled out as a problem for the Italian economy, by contributing to keep it focused on small-scale and low-tech productions and, thus, hindering the formation of larger-sized companies and playing a part in maintaining the country specialized in traditional goods production with a low innovation content. According to this view, in the background of globalization – with the fierce competition from low-labor-cost emerging economies denting on traditional goods markets – and of the ICT revolution – demanding quick reorganization of production along lines possibly out of reach for small ID firms – IDs are held partly liable for damaging the country's competitiveness.

The reasoning above would probably suggest that the Italian economy should abandon its deeply rooted IDs to breakaway into a re-specialization along high-tech avenues and, so, intensify innovation to regain competitiveness. Against this setting, is it possible to think of a viable evolution of IDs in a way to obtain innovation via contiguous re-specialization? Specifically, we observe that, against the overall GDP stagnation and erosion of competitiveness, some ID segments keep showing remarkably good performance. This is the case for the mechanics compartment. Indeed, it has been observed that many of the best performing IDs either specialized in mechanics or showed signs of a vertical re-specialization, evolving from the production of final goods to the production of the related investment goods. Perhaps the best example of this latter case is offered by Vigevano, an ID specializing once in shoe making and now in the production of shoe-making capital goods (Ferri and Ventura, 2005). But Vigevano is not the only example and it has been shown that performance is generally better for the various IDs undergoing analogous vertical re-specialization. The argument may be brought to the point of suggesting that this type of vertical re-specialization could offer Italy a way to upgrade its competitiveness by moving from its traditional final goods to the related investment goods. Furthermore, if we hold on to this argument, a second question is whether specific forms of finance can promote this type of beneficial re-specialization.

Accordingly, in this paper, we address two research questions. First, we check whether innovation is more likely for ID firms specializing in the production of capital goods for the “made in Italy” final goods. Second, we assess whether re-specialized ID firms show any peculiar trait in their financial structure/relationship with intermediaries.

We address both research questions through pooled regressions on the latest two waves of the Capitalia survey. Although the survey coverage does not have enough observations of re-specialized firms in the re-specialized IDs, it contains a large-enough number of ID firms in mechanics and even in the sub-sector of those producing capital goods for the most typical “made in Italy” final goods (food products; textiles and clothing; furnishings; leather & shoes, etc.). On this basis, we obtain a fairly reliable set of qualitative indications.

Our analysis builds on Herrera and Minetti (2005) who find that the information of firms' main banks, proxied by the duration of credit relationships, fosters innovation. The impact applies to product and process innovations and is absent for R&D expenditure. We augment their approach on several respects. First, we introduce ID-related variables – to capture any specific effect on innovation depending on ID spillovers – and singled out not only firms belonging to IDs but also those specializing in the production of capital goods for the “made in Italy” final goods. Second, we introduce new financial structure variables: (i) leverage; (ii) whether the firm belongs

to a credit, export or research consortium; (iii) whether it is listed, subscribes innovative financial instruments or minority shares are underwritten by financial or non-financial private operators. Third, we improve on Herrera and Minetti's regression specifications in the following ways: (i) we introduce a filtering criterion for reducing the presence of measurement errors in the data on product innovation; (ii) after using an appropriate methodology for measuring R&D intensity (based on Parisi *et al.* 2005), we examine the importance of bank's information on the probability for a firm to switch from low to high levels of R&D intensity.

In line with Herrera and Minetti (2005), our results confirm that the more intense relationship lending – as measured by the length of the relationship between the firm and its main bank – the more likely firms make innovations. Differently from Herrera and Minetti (2005) – who considered only the next to latest wave of the Capitalia survey –, we find that relationship lending impacts not only innovation, of product or process, but also the intensity of R&D expenditures. Furthermore, while we still detect no significant impact of the financial development index proposed by Guiso *et al.* (2004a), we show that additional financial variables – not considered by Herrera and Minetti (2005) – have a positive impact on innovation and R&D expenditure. More importantly for us, while we find no specific effect for generic ID firms, product innovation is more likely for ID firms specializing in the production of capital goods for the “made in Italy” final goods and the impact of relationship lending on innovation is stronger only for this class of ID firms.

The remainder of the paper proceeds with a concise survey on the links between finance and innovation, focusing on the empirical literature on individual firm data (Section 2). In Section 3 we provide some detail on the Capitalia survey data, which we use in the regression analysis, and discuss some preliminary descriptive evidence. Section 4 explains our regression methodology, reports the related results and discusses them. Finally, in Section 5 we consider the policy implications of our findings and lay out possible paths for future research.

2. Background and literature review

The main contribution of this paper is the empirical part presented in the following Section. Before moving to that, however, we need to accomplish two tasks. First, we must draw the background of the Italian economy against which our investigation may bestow policy implications. Second, we need to make a concise review of the literature on finance and innovation at the firm level.

2.1 Background: Italy's re-specialization and finance

There is consensus among economists that the main source of growth is the dynamics of total factor productivity, once called Solow residuals. In turn, this dynamics hinges on the ability of the economy to innovate. Eventually, thus, the finance-growth nexus may be re-specified as a finance-innovation-growth nexus. In this paper, by using firm micro-data, we focus on the first juncture of such nexus.

Specifically, we have two objectives: (1) identify a productive re-specialization conducive to higher propensity to innovate; (2) investigate whether firms in general – and particularly those in the re-specialized segment – show special features in terms of the link between financial structure and propensity to innovate.

As to the first objective, building on a priori we draw from other works, we concentrate on the characteristics of a particular type of Italian firms, namely those firms producing capital goods used in the production of the typical “made in Italy” final goods (food products; textiles and clothing; furnishings; leather & shoes, etc.). The chief reason to take this angle is that this

class of firms could prove the most suitable to improve Italy's propensity to innovate. In particular, our reasoning is articulated along the following steps: (i) it is a fact that Italy's stagnation is due to low innovation, partly depending on the country's productive specialization, i.e. there seems to be a need for re-specialization; (ii) an economy's re-specialization is a costly process and the cost may be reduced if the new specialization regards segments contiguous to the one of previous specialization, i.e. there is a case for re-specializing in segments contiguous to the staple production, that of "made in Italy" final goods; (iii) the propensity to innovate is higher in capital goods than in final goods segments, which implies re-specializing in capital goods segments. Taking (i), (ii) and (iii) altogether suggests considering the re-specialization toward the capital goods of the "made in Italy" as a promising strategy. To validate this argument, we will also need to show that the propensity to innovate is indeed higher for this type of re-specialized firms.

Once agreed that this type of re-specialization is promising, our focus moves on to the second objective, namely exploring the possible link between financial structure and propensity to innovate. In particular, we want to ascertain whether this finance-innovation link displays specific features for firms producing capital goods for the "made in Italy" final goods.

Since the research agenda of this paper should already be clear, we may now turn to draw a synthetic review of the relevant literature.

2.2 Literature review on re-specialization and on the link between firm-level innovation and finance

The possibility that Italy's economy would stand to gain by re-specializing from the production of made-in-Italy final goods to that of the capital goods used in producing those final goods has been put forward by De Arcangelis and Ferri (2005). They argue that such re-specialization would likely improve the innovation propensity of the Italian economy. Consistently with this view, focusing on industrial districts (IDs), they show that the export performance of Italy has systematically been better in the made-in-Italy capital goods than in the made-in-Italy final goods. This is also corroborated by more recent evidence provided by ICE (2006). Furthermore, De Arcangelis and Ferri show that between 1991 and 2001 Italy's IDs displayed some evolution from final to capital goods of the made-in-Italy in terms of export composition. In another paper on the performance of Italy's IDs between 1991 and 2001, Ferri and Ventura (2005) find some additional evidence consistent with some degree of re-specialization from final to capital goods of the made-in-Italy. They also show that this re-specialization may be beneficial to the Italian economy in terms of helping increase firm average size. Finally, Ferri and Ventura illustrate that re-specializing IDs enjoyed much better performance than the other IDs in terms of employment.

Thus, evidence seems to be cumulating on the possible benefits of this type of re-specialization for the Italian economy. But is there any role for finance within this picture? Naturally, the most likely nexus comes through the possible special role of finance in supporting the development of firms with a higher propensity to innovate.

The issue whether finance influences innovation at firms has been perhaps one of the most debated for a long time. Indeed, if one believes that finance positively impinges on development, he would expect this link – going through firm innovation – to be the primary channel. Against this background, Herrera and Minetti (2005) observe that the theoretical literature offers ambiguous predictions on the effect of banks' information on innovation. This depends on two opposing effects: (i) the moral hazard of the entrepreneur; (ii) the moral hazard of the bank. Specifically, the moral hazard of the entrepreneur depends on the fact that he can divert output ex post by choosing higher-risk projects (De la Fuente and Marin, 1996) and this moral hazard is probably more intense for innovative firms (Carpenter and Petersen, 2002). As such, the

information of the bank is key to overcome this moral hazard, thus raising the pledgeable expected return to a level that covers the bank's opportunity cost of funds. Therefore, the moral hazard of the entrepreneur suggests that innovative firms should make larger recourse to informed bank finance. However, the moral hazard of the bank pushes in the opposite direction. Innovative firms are more likely to be informationally captured by the bank (Rajan, 1992; Ueda, 2004), and it is possible that the bank will try to extract rents from them, so expropriating their profits (hold-up problem). As a result, expecting this *ex ante*, innovative firms might choose to avoid informed bank finance, but this might result in forgoing the investment if informed bank financing cannot be substituted for.

All in all, the literature seems to suggest that informed bank finance should be particularly suitable to support innovative firms but the extent to which innovation is, in practice, supported by this form of financing could be low if the hold-up problem is particularly severe. Accordingly, since theoretical predictions are ambiguous, it becomes an empirical issue whether, in practice, innovative firms are more or less likely to use informed bank finance.

Using the 2002 wave of the Capitalia survey, Herrera and Minetti (2005) offer an empirical answer to this question. Specifically, measuring the extent of informed bank finance by means of the length of the relationship with the main bank, they find that the information of firms' main banks fosters innovation. Moreover, they also show that this positive effect is economically and statistically more significant for product than for process innovations, while they find evidence of no link between informed bank finance and whether firms make R&D expenditures or not.

Thus, Herrera and Minetti's findings are promising for our endeavor to shed light on whether the extent of innovation by ID firms – and particularly those ID firms re-specialized from final goods to capital goods of the made-in-Italy – is influenced by the extent of informed bank finance. Accordingly, in the following we will augment Herrera and Minetti's approach also to capture the possible specificities of ID firms, in general, and, in particular, of re-specialized ID firms.

3. The Capitalia Survey and Some Descriptive Evidence

We use the data from the Survey of Manufacturing Firms (SMF) run formerly by Mediocredito Centrale and nowadays by Capitalia, two credit institutions (Mediocredito Centrale is now part of Capitalia). Our analysis builds on two waves run in 2002 (covering the 1998-2000 period) and 2004 (covering the 2001-2003 period). The data obtained from these two waves are pooled for estimation purposes. The SMF consists of the universe of firms with more than 500 employees and of a stratified sample of firms with less than 500 employees but with more than 10 employees. In order to ensure representativeness of the smaller firms, the sample is stratified by firm size (number of employees), by sector (four sectors according to the Pavitt taxonomy) and by geographical area (North and Center-South). Each sample comprises over 4,000 firms with around 50% of the firms replaced with new firms in each survey (rotating panel).¹

In table 1 we report the definitions and sources of the data used. While table 2 reports some descriptive evidence.

From the SMF we have used the information available on innovation, of product or process, and R&D investments made by firms. In our sample, firms' R&D Intensities are R&D expenditure ratios relative to production. R&D expenditure is deflated with a weighted average of the hourly earnings in manufacturing index and the aggregate business investment price index, where the weights used are respectively 0.9 and 0.1, as in Parisi *et al.* (2005). Production is computed as the sum of sales, capitalized costs and the change in work-in-progress and in finished goods inventories, with all variables deflated by the appropriate production price index.

¹ There are several reasons for requiring a replacement: firms that do not belong any longer to the manufacturing sector; firms that have reduced the number of employees below 11; firms that have ceased their activity.

Beside the availability of detailed information on firm innovation, the usefulness of the SMF consists in providing also detailed information on firm-bank relationships and, more in general, on firms' financial structure. Following Herrera and Minetti (2005), we use the duration of the firms' relationship with the main bank as a proxy for the informational tightness of bank-firm relationships. Moreover, to better capture financial structure, we include the following variables: leverage; whether the firm belongs to a credit, export or research consortium; whether it is listed or subscribes innovative financial instruments; whether minority shares are underwritten by financial or non-financial private institutions; share of equity of the largest owner; number of banks from which the firm borrowed.

We considered data on the presence of banks in local markets during the 1991-1998 period: number of branches per 1,000 inhabitants in the province; Herfindahl-Hirschman Index (HHI) on bank loans in the province; new branches created by entrants or incumbents per 1,000 inhabitants in the province. All these data are based on Bank of Italy statistics and we used the values computed in Herrera and Minetti (2005).

Moreover, we have used some variables related to growth taken from Guiso *et al.* (2004b,a). The share of bank branches owned by local banks, the number of saving banks per 1,000 inhabitants in the region, the number of cooperative banks per 1,000 inhabitants in the region, bank branches per 1,000 inhabitants in the region are a set of variables describing the banking market as of 1936. Financial development is the indicator of local banking development computed by Guiso *et al.* (2004a). In particular, they show that the determinants of the geographical differences in the degree of financial development are those variables describing the structure of the banking market in 1936. Moreover, they show that local financial development, together with local social capital and judicial efficiency, are strictly related to economic development. Social capital is measured by average voter turnout at the province level for all referenda in the period between 1946 and 1987, while judicial inefficiency is measured by the number of years it takes to have a first-degree judgment in the province.

We have considered ID-related variables and singled out not only firms belonging to IDs but also those specializing in the production of capital goods for the "made in Italy" final goods. However, given the very small number of firms that are both located in an ID of the "made-in-Italy" and belong to the machinery manufacturing for the "made-in-Italy" (a total number of 56), we have excluded the related dummy variable from the estimation sample.

Finally, industry and time dummies have been considered (for simplicity not reported in tables 1 and 2), with industry dummies based on a two-digit ATECO classification.

4. Regression Methodology and Main Results

4.1 The empirical model

Following the framework of Herrera and Minetti (2005), firm's decision to innovate can be modeled as:

$$\begin{cases} y = 1 & \text{if } y^* > 0, \\ y = 0 & \text{if } y^* \leq 0, \end{cases} \quad (1)$$

with

$$y^* = \alpha_1 x + z_1 \delta_{11} + u. \quad (2)$$

Where: y is a measure of the innovation choice (a binary variable equal to 1 if the firm innovates and 0 otherwise); y^* is a vector which comprises: (i) the pledgeable expected return of the new technology net of the opportunity cost of funding for the bank, and (ii) the expected return that the firm will be able to appropriate from the new technology (compared to the return partially appropriated by the bank in the form of rents) net of the expected return that the firm will be able to appropriate from the mature technology; x is the length of the credit relationship with the main bank, a proxy used by Herrera and Minetti for measuring the informational tightness of the firm-bank relationship; z_1 is a vector of control variables and u is a stochastic error term.

In order to avoid problems of endogeneity in the estimation of the relation between the firm's innovation choice and the main bank's amount of information, we use a two-stage estimation approach. First we define a vector of instrumental variables that are correlated with the length of the credit relationship, but are uncorrelated with the error term in our regressions relating innovation of product or process and the information of firm's main bank. The effect of these instruments on x is captured by the vector δ_{22} in the following "relationship equation":

$$x = z_1\delta_{21} + z_2\delta_{22} + v \quad (3)$$

where z_1 is the vector of control variables in (2), z_2 is the vector of instruments and v is the stochastic error term. After having defined our instruments we estimate the model (1)-(3) by means of two-stage least squares (2SLS).²

The instruments used in the present empirical analysis are broadly similar to those used by Herrera and Minetti: a set of variables that describe the banking market in 1936 (the share of bank branches owned by local banks, the number of saving banks per 1,000 inhabitants in the region, bank branches per 1,000 inhabitants in the region), when a strict entry regulation was introduced; a set of variables that describe the presence of banks in local markets during the interval 1991-1998 (the new branches created by entrants or incumbents per 1,000 inhabitants in the province), which corresponds to a period of deregulation characterized by an intense consolidation process in the banking sector. We refer to Herrera and Minetti (2005) for a detailed discussion on the justification of these instruments.

As control variables we have considered data on individual characteristics of each firm like the firm's demographics or financial structure and the features of the firm's activity related to IDs or international competition. We have included also variables describing regional or provincial characteristics like the South dummy, per capita value added, social capital and judicial efficiency, number of branches and HHI.

Compared to Herrera and Minetti (2005), we have introduced new financial structure variables: leverage; whether the firm belongs to a credit, export or research consortium; whether the firm is listed; whether the firm subscribes innovative financial instruments; whether minority shares are underwritten by financial or non-financial private operators. Moreover, we augment Herrera and Minetti in that they did not consider the features of firm's activity related to IDs.

4.2 Findings for innovation

² The 2SLS estimation method relies on the assumption of a linear probability model for innovation. Herrera and Minetti (2005) provide also estimates derived from the two-stage conditional maximum likelihood (2SCML) technique, which does not require the assumption of a linear probability model. In the empirical analysis of Herrera and Minetti the findings obtained from these two estimation methods are qualitatively similar.

Tables 3-6 present the results for innovation, of process or product. The endogenous variable is a binary variable which takes the value 1 if the firm has realized product or process innovations and 0 otherwise. Each table reports the estimates obtained from pooled OLS and IV regressions. As discussed earlier, in order to avoid problems of endogeneity associated to the length of the credit relationship, we instrument this variable. As it is possible to see from tables 3-5, the length of the credit relationship is significant in the OLS estimates, but the sign of the coefficient is negative. On the contrary, after instrumenting, the length of the credit relationship has a positive and significant effect on product or process innovation taken together and on process innovation taken separately. Product innovation do not seem affected by the information of the bank. The latter finding might be due to two reasons: the length of the credit relationship is a worse proxy for the information of the bank; contrary to process innovation, product innovation is measured imprecisely in the survey.³ In order to control for measurement problems, we filter the binary variable “product innovation” by setting equal to 0 product innovations associated with a share of sales due to innovative products equal to zero percent.⁴ As it is possible to see from table 6, after filtering and instrumenting, the length of the credit relationship has a positive and significant effect on product innovation.

Regarding the other determinants of innovation, we have the following findings for the IV estimates. The results for the control variables are generally consistent with the findings of the extant literature. While age has a negative significant impact, ownership concentration, international competition, ISO9000 certification and size have a positive significant impact on both product and process innovations. These findings are consistent with those reported in Herrera and Minetti (2005).

The financial structure of the firm – leverage and sources of external finance alternative to bank debt, both disregarded by Herrera and Minetti – has a positive and significant effect on both product and process innovations. In particular, our estimates show that firms engaging in product innovations make a relevant use of innovative financial instruments and minority shares (both significant at the 1% level), which offset their reluctance to list the company (not significant). For firms that realize process innovations the use of minority shares is not statistically significant.

According to Herrera and Minetti (2005) being a member of a consortium – they lump together export, credit and research consortia – does not have a significant effect on innovation. On the contrary, we find that being a member of an export consortium (for product and process innovation) or a credit consortium (for product innovations only) has a positive and significant impact. The latter difference is due to the fact that, contrary to Herrera and Minetti, we have decomposed the several types of consortia (credit, export, research).

Contrary to Herrera and Minetti, the control variables describing the presence of banks in local markets have coefficients which are significant and with expected signs: the number of branches has a significant positive effect on process innovation (at the 5% level), while the HHI has a significant negative effect on product innovation (at the 10% level).

Finally, concerning IDs variables we obtain some new and interesting findings. While for process innovation there is no significant impact of ID variables, firms located in an industrial district and belonging to the machinery manufacturing for the made-in-Italy have a significant positive impact on product innovation (at the 5% level).

4.3 Findings for R&D

³ For instance, some firms may declare to have realized innovative products which actually are innovative only formally but not substantially.

⁴ The Capitalia Survey contains a specific question on the percentage of sales due to the introduction of innovative products, separate from the question on whether the firm has realized product innovations during the three-year horizon of the Survey.

Given the result that the tightness of the credit relationship benefits innovation, as confirmed by our analysis, we examine now what are the implications for R&D. In particular, we investigate whether informed finance affects innovation by means of fostering firms' internal research. In table 7 we report the findings on the effect of the length of the credit relationship on R&D investment. In this case the endogenous variable is a binary variable which takes the value 1 if the firm has made R&D investments and 0 otherwise.

Notice that being a firm located in an ID and belonging to the machinery manufacturing industry has a positive and significant impact on the probability of realizing R&D investments (significant at the 1% level). In addition, beside the significance of credit and export consortia also research consortia turn out positive and significant here. Moreover, similarly to Herrera and Minetti (2005), we find that the effect of the length of the credit relationship on the R&D decision of the firm is not statistically significant. This finding seems consistent with the popular view, mainly based on anecdotal evidence, that bank's informational role does not support firms' research efforts. But is this story really true?

A recent survey performed by Ughetto (2006), based on the largest 12 banks in Italy, provides an overview of the existing forms of credit support to R&D activities and makes an assessment of the impacts of the New Basel Capital Accord on the screening of innovative firms. What emerges from this study is that banks are currently improving their support to borrowing firms' technology- and science-based investment. This implies a parallel improvement in the use of non-financial parameters to assess the creditworthiness of borrowers.⁵ Thus, our finding of no significant impact of bank's information on R&D investment might not hold for future waves – unobservable now – of the Capitalia data.

The high degree of risk and the complexity of evaluating future prospects of activities related to innovation makes banking intermediaries not ideal for financing R&D expenditures and increases the probability of firms, especially high-tech ones, being credit constrained (see Guiso, 1998). And this is true independently of the degree of bank market development (see Rotondi, 2006b). However, the length of the credit relationship may play an important role for the firms that, after being over time successful in their R&D activities, desire to operate a substantial upgrade by increasing significantly their R&D intensity.

In table 8 we report the results for this further analysis. Here the endogenous variable is a binary one taking the value 1 if the firm has R&D intensities higher than 1% and 0 if the firm has made R&D expenditures but with intensity equal to or lower than 1%. This threshold value equals the median value of R&D intensity. As it is possible to see from the table, the length of the credit relationship has a significant positive effect on firms' decision to reach high R&D intensity (at the 5% level). Hence, our findings support the importance of the role of bank's information on the probability for a firm to switch from low to high levels of R&D intensity.

4.4 Robustness analysis

Still following Herrera and Minetti (2005), we perform two robustness checks: we control for the log of the number of banks from which the firm borrowed and for the indicator of local financial development built by Guiso *et al.* (2004a). The length of the credit relationship with the main bank might not capture exhaustively the informational tightness, as firms may have multiple bank relationships (see Detragiache *et al.*, 2000). Moreover, instead of capturing banks' informational role, the effect of the length of the credit relationship may pick up the effect of local access to finance (see Guiso *et al.*, 2004a).

⁵ An interesting and related issue is how R&D investment is valued by capital markets. A recent work of Hall and Oriani (2005) finds that the valuation of R&D in publicly traded Italian firms by the financial market relies heavily on the degree of ownership concentration: firms featuring a single large shareholder (which holds more than one third of the firm) have high R&D valuations; otherwise R&D is basically not valued at all in the remaining firms.

Tables 9-12 report the findings of the robustness analysis. As it is possible to see from tables 11 and 12, in the cases of product innovation and the variable “high R&D intensity” the results for the length of credit relationship are not affected. While, as reported in table 10, in the case of process innovation the effect for the length of credit relationship is affected by the introduction of the indicator of local financial development. But financial development is not statistically significant (even if we eliminate from the regression the length of the credit relationship with the main bank). Thus we can argue that the findings on banks’ informational tightness are robust also for process innovation.

The conclusions reached for local financial development are not surprising. Indeed, Rotondi (2005) and (2006a,b) and Benfratello *et al.* (2006) find limited support for the role of local financial development on firms’ innovation and amount of R&D expenditures.

4.5 Testing the differential effect of the length of the credit relationship

From a theoretical point of view we do not expect all firms to be equally affected by the length of the credit relationship with the main bank. The duration may interact with other variables relevant for defining the quality of the firm-bank relationships. For instance, (i) the share of the firm’s bank debt held by the main bank, (ii) the location of the main bank (e.g. in the same province or ID of the firm), (iii) location of the firm (e.g. in an ID), or (iv) the degree of ownership concentration may interact with the duration and affect the informational tightness of bank-firm relationships. Given the focus of the present study, here we test only whether ID variables interact with the duration variable and leave for future research the other issues above.

Tables 13 and 14 report the findings for the interaction analysis. The technique used borrows from that first introduced by Rajan and Zingales (1998) and now become standard. As it is possible to see from the tables, for product innovation we find a positive and significant interaction of the duration of the credit relationship with the firms located in an ID and belonging to the machinery manufacturing industry for the made-in-Italy (at the 5% level). While for process innovation or the variable “high R&D intensity” there is no significant interaction.

5. Conclusion

The Italian economy lost steam during the last decade. Once the leading hedge of the country’s flexible specialization model, industrial districts (IDs) are now often identified as a source of Italy’s problems by helping keep the specialization of the economy in sectors highly exposed to stiff competition from emerging economies. Yet, against the overall GDP stagnation and erosion of competitiveness, some ID segments showed remarkably good performance. This is the case for the mechanics compartment. Indeed, it has been observed that many of the best performing IDs either specialized in mechanics or showed signs of a vertical re-specialization, evolving from the production of final goods to the production of the related investment goods. The argument may be brought to the point of suggesting that this type of vertical re-specialization could offer Italy a way to upgrade its competitiveness by moving from its traditional final goods to the related investment goods.

Against such background, the aim of this paper was to study whether there were any financial peculiarities behind the vertical re-specialization of the successful IDs. Specifically, producing capital rather than final goods – by lengthening the productive cycle and embodying more technology – supposedly postulates changes in the optimal financial structure too. The optimal level of leverage may increase while the larger component of intangible capital may make it more difficult for arm’s length financiers to supply funds and call for either venture capitalists or relationship lenders. Also, firms in vertically re-specializing IDs could be more

open to financial innovation. Thus, the supply of specific forms of finance may be key to successful re-specialization.

We tested these hypotheses using data taken from the latest two waves of the Capitalia survey. Although the survey coverage does not have enough observations of re-specialized firms in the re-specialized IDs, it contains a large-enough number of ID firms in mechanics and even in the sub-sector of those producing capital goods for the most typical “made in Italy” final goods (food products; textiles and clothing; furnishings; leather & shoes, etc.). On this basis, we obtained a fairly reliable set of qualitative indications. Building on Herrera and Minetti (2005), we confirmed that the more intense relationship lending – as measured by the length of the relationship between the firm and its main bank – the more likely firms make innovations. Differently from Herrera and Minetti (2005) – who considered only the next to latest wave of the Capitalia survey –, we found that relationship lending impacts not only innovation, of product or process, but also the intensity of R&D expenditures. Furthermore, while we still detected no significant impact of the financial development index proposed by Guiso, Sapienza and Zingales (2004), we showed that additional financial structure variables – e.g. belonging to a credit or export consortium; subscribing innovative financial instruments, variables not considered by Herrera and Minetti (2005) – have a positive impact on innovation and R&D expenditure. More importantly for us, while we found no specific effect for generic ID firms, product innovation is more likely for ID firms specializing in the production of capital goods for the “made in Italy” final goods and the impact of relationship lending on innovation is stronger only for this class of ID firms.

Our evidence has clear and cogent policy implications. The Italian economy stands to benefit greatly from a quick redeployment to the made in Italy capital goods sector. This would enhance innovation and strengthen competitiveness. Appropriate financial structures are key to this passage.

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TABLE 1 – Variables: definition and source

	Definition	Source
Relationship length	Number of years of the relationship between the firm and its main bank taken at the beginning of each three-year wave (i.e. minus 3) and divided by 100	Capitalia Survey
Branches	Average number of branches per 1000 inhabitants in the province during the 1991-1998 period	Herrera-Minetti (2005)
Herfindahl	Average Herfindahl-Hirschman Index on bank loans in the province during the 1991-1998 period	Herrera-Minetti (2005)
Leverage	Ratio of financial debt to financial debt plus net capital	AIDA
Major owner	Share of equity of the largest owner	Capitalia Survey
Listed company	Dummy that takes the value of 1 if the firm is a listed company; 0 otherwise	Capitalia Survey
Innovative financial instruments	Dummy that takes the value of 1 if the firms has made use innovative financial instruments; 0 otherwise	Capitalia Survey
Minority shares underwritten by financial operators	Dummy that takes the value of 1 if new minority shares have been underwritten by financial operators; 0 otherwise	Capitalia Survey
Minority shares underwritten by non-financial private operators	Dummy that takes the value of 1 if new minority shares have been underwritten by non-financial private operators; 0 otherwise	Capitalia Survey
Credit consortium	Dummy that takes the value of 1 if the firm belongs to a credit consortium; 0 otherwise	Capitalia Survey
Export consortium	Dummy that takes the value of 1 if the firm belongs to a export consortium; 0 otherwise	Capitalia Survey
Research consortium	Dummy that takes the value of 1 if the firm belongs to a research consortium; 0 otherwise	Capitalia Survey
Corporation	Dummy that takes the value of 1 if the firm is a corporation; 0 otherwise	Capitalia Survey
Group	Dummy that takes the value of 1 if the firm belongs to a group; 0 otherwise	Capitalia Survey
Age	Log of the number of years of the firm from its foundation	Capitalia Survey
Size	Log of the number of employees	Capitalia Survey
Financial development	Measure of regional financial development computed in Guiso-Sapienza-Zingales (2004a)	Guiso <i>et al.</i> , 2004a
Number of Banks	Log of the number of banks from which the firm borrowed	Capitalia Survey
Judicial inefficiency	Judicial inefficiency is measured by the number of years it takes to have a first-degree judgement in the province (see Guiso <i>et al.</i> , 2004b).	Guiso <i>et al.</i> , 2004b
Social Capital	Social capital is measured by average voter turnout at the province level for all referenda in the period between 1946 and 1987 (see Guiso <i>et al.</i> , 2004b)	Guiso <i>et al.</i> , 2004b
Per capita value added	Per capita value added in the province of 1991	ISTAT
Share of bank branches owned by local banks in 1936	Share of bank branches owned by local banks in 1936 province (see Guiso <i>et al.</i> , 2004a)	Guiso <i>et al.</i> , 2004a
Number of saving banks in the region in 1936	Number of saving banks per 1000 inhabitants in the region in 1936 (see Guiso <i>et al.</i> , 2004a)	Guiso <i>et al.</i> , 2004a
Bank branches in the region in 1936	Bank branches per 1000 inhabitants in the region in 1936 (see Guiso <i>et al.</i> , 2004a)	Guiso <i>et al.</i> , 2004a
New branches entrant	Average number of new branches created by entrants per 1000 inhabitants in the province during the 1991-1998 period	Herrera-Minetti (2005)
New branches incumbent	Average number of new branches created by incumbents per 1000 inhabitants in the province during the 1991-1998 period	Herrera-Minetti (2005)

(continued)

TABLE 1 – Variables: definition and source (continued)

	Definition	Source
Innovation	Dummy that takes the value of 1 if the firm has realized (product or process) innovations; 0 otherwise	Capitalia Survey
Process innovation	Dummy that takes the value of 1 if the firm has realized process innovations; 0 otherwise	Capitalia Survey
Product innovation	Dummy that takes the value of 1 if the firm has realized product innovations; 0 otherwise	Capitalia Survey
R&D investment	Dummy that takes the value of 1 if the firm has realized R&D investments; 0 otherwise	Capitalia Survey
R&D intensity	Intensity is measured as R&D expenditure ratio relative to production. R&D expenditure is deflated with a weighted average of the hourly earnings in manufacturing index and the aggregate business investment price index, where the weights used are respectively 0.9 and 0.1 (see Parisi <i>et al.</i> , 2005). Production is computed as the sum of sales, capitalized costs and the change in work-in-progress and in finished goods inventories, with all variables deflated with the appropriate production price index.	AIDA, ISTAT and Capitalia Survey
High R&D intensity	Dummy that takes the value of 1 if the firm has realized an R&D intensity greater than 1 percent (median value); 0 otherwise	AIDA and Capitalia Survey
Sales due to the introduction of innovative products	Share of sales due to the introduction of innovative products	Capitalia Survey
International competitors	Dummy that takes the value of 1 if the firm has international competitors; 0 otherwise	Capitalia Survey
ISO9000 certified	Dummy that takes the value of 1 if the firm is ISO9000 certified; 0 otherwise	Capitalia Survey
South	Dummy that takes the value of 1 if the firm is located in a region South of Rome, with Lazio excluded; 0 otherwise	Capitalia Survey
Located in an industrial district and belongs to the same industry of the district	Dummy that takes the value of 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district but not necessarily belongs to the same industry of the district	Dummy that takes the value of 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	Dummy that takes the value of 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district and belongs to the machinery manufacturing industry	Dummy that takes the value of 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	Dummy that takes the value of 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district of the made-in-Italy and belongs to the machinery manufacturing for the made-in-Italy industry	Dummy that takes the value of 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey

TABLE 2 – Summary statistics for the sample used in estimation

	MEDIAN	MEAN	1st PERCENTILE	99th PERCENTILE	STANDARD DEVIATION
Relationship length	12	14.578	0	52	12.093
Branches	0.473	0.460	0.202	0.795	0.118
Herfindahl	0.064	0.070	0.036	0.196	0.028
Leverage	0.923	0.885	0.467	0.998	0.118
Major owner	0.5	0.579	0.02	1	0.281
Listed company	0	0.012	0	1	0.108
Innovative financial instruments	0	0.043	0	1	0.203
Minority shares underwritten by financial operators	0	0.012	0	1	0.110
Minority shares underwritten by non-financial private operators	0	0.012	0	1	0.111
Credit consortium	0	0.030	0	1	0.170
Export consortium	0	0.017	0	1	0.130
Research consortium	0	0.005	0	0	0.070
Corporation	1	0.959	0	1	0.198
Group	0	0.261	0	1	0.439
Age	3.135	3.069	1.386	4.585	0.676
Size	3.466	3.767	2.398	7.179	1.111
International competitors	0	0.344	0	1	0.475
ISO9000 certified	0	0.473	0	1	0.499
Judicial inefficiency	2.872	3.266	1.883	7.467	1.003
Social Capital	0.86	0.840	0.660	0.910	0.062
Per capita value added	2.663	2.613	1.997	3.000	0.235
South	0	0.154	0	1	0.361
Located in an industrial district and belongs to the same industry of the district	0	0.135	0	1	0.342
Located in an industrial district but not necessarily belongs to the same industry of the district	0	0.480	0	1	0.500
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0	0.307	0	1	0.461
Located in an industrial district and belongs to the machinery manufacturing industry	0	0.073	0	1	0.260
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0	0.011	0	1	0.104
Located in an industrial district of the made-in-Italy and belongs to the machinery manufacturing for the made-in-Italy industry	0	0.006	0	0	0.079

(continued)

TABLE 2 – Summary statistics for the sample used in estimation (continued)

	MEDIAN	MEAN	1st PERCENTILE	99th PERCENTILE	STANDARD DEVIATION
Financial development	0.435	0.410	0.027	0.587	0.138
Number of banks	1.609	1.512	0	2.996	0.613
Sales due to the introduction of innovative products	0	0.089	0	0.900	0.185
Innovation	1	0.536	0	1	0.499
Process innovation	0	0.404	0	1	0.491
Product innovation	0	0.332	0	1	0.471
Product innovation (with filtering)	0	0.279	0	1	0.449
R&D	0	0.415	0	1	0.493
High R&D intensity	1	0.530	0	1	0.499
R&D intensity	0.011	0.022	0.000	0.153	0.030
Bank branches in the region in 1936	0.222	0.245	0.083	0.531	0.119
Share of bank branches owned by local banks in 1936	0.886	0.811	0.507	0.972	0.143
Number of saving banks in the region in 1936	0.003	0.003	0	0.010	0.003
New branches entrant	0.002	0.003	0.000	0.009	0.002
New branches incumbent	0.024	0.024	0.008	0.042	0.009

TABLE 3 – Determinants of innovation

	OLS		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.144383**	0.062848	2.079237*	1.134991
Branches	-0.012671	0.079789	0.145660	0.117644
Herfindahl	0.231188	0.293337	-0.243976	0.411037
Leverage	0.168538***	0.055740	0.221891***	0.067482
Major owner	0.000502	0.023840	0.039766	0.033229
Listed company	0.056942	0.055182	0.079687	0.068856
Innovative financial instruments	0.090976***	0.027668	0.125058***	0.035206
Minority shares underwritten by financial operators	0.063066	0.049522	-0.001040	0.061706
Minority shares underwritten by non-financial private operators	0.207415***	0.045094	0.274981***	0.058684
Credit consortium	0.094709***	0.033102	0.093431**	0.036795
Export consortium	0.165680***	0.041133	0.122441**	0.050567
Research consortium	0.019392	0.074751	0.046758	0.074253
Corporation	0.077435**	0.032996	0.081180**	0.036862
Group	-0.020385	0.016747	0.014861	0.025283
Age	0.029245**	0.011392	-0.180929*	0.107740
Size	0.078236***	0.007232	0.070904***	0.009044
International competitors	0.119274***	0.013766	0.125920***	0.015564
ISO9000 certified	0.032674**	0.013645	0.037386**	0.015303
Judicial inefficiency	-0.006869	0.007710	-0.004942	0.008370
Social Capital	0.355264	0.231056	0.051288	0.293150
Per capita value added	0.004307	0.046678	-0.049868	0.059404
South	0.027241	0.039247	0.035074	0.043276
Located in an industrial district and belongs to the same industry of the district	-0.006770	0.022750	-0.029208	0.027480
Located in an industrial district but not necessarily belongs to the same industry of the district	0.002048	0.020036	-0.006680	0.022400
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0.000497	0.018740	0.006153	0.020567
Located in an industrial district and belongs to the machinery manufacturing industry	0.055080	0.035305	0.066821*	0.040038
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.009375	0.060764	0.059442	0.069949
<i>Observations</i>	6238		6235	
<i>F-test, F-statistic</i>	18.48***		14.13***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one (process or product) innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 4 – Determinants of process innovation

	OLS		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.112058*	0.063998	2.158911*	1.141679
Branches	0.077746	0.081264	0.246619**	0.118113
Herfindahl	0.223819	0.294939	-0.278038	0.412239
Leverage	0.131719**	0.055713	0.187544***	0.067701
Major owner	-0.038256	0.024044	0.001231	0.033541
Listed company	0.047918	0.068389	0.070956	0.078704
Innovative financial instruments	0.100920***	0.030221	0.135518***	0.037761
Minority shares underwritten by financial operators	0.024322	0.057452	-0.041404	0.070767
Minority shares underwritten by non-financial private operators	0.041830	0.059002	0.110593	0.072291
Credit consortium	0.052092	0.035319	0.050644	0.039210
Export consortium	0.135384***	0.045044	0.090892*	0.052593
Research consortium	0.061032	0.088792	0.088662	0.088898
Corporation	0.048988	0.033071	0.052937	0.037306
Group	-0.002650	0.017014	0.032554	0.025568
Age	0.023937**	0.011725	-0.190954*	0.108523
Size	0.079792***	0.007505	0.072605***	0.009244
International competitors	0.076866***	0.014015	0.083607***	0.015805
ISO9000 certified	0.025174*	0.013743	0.030279*	0.015455
Judicial inefficiency	0.154078	0.231616	-0.162512	0.294574
Social Capital	0.002828	0.007697	0.005052	0.008391
Per capita value added	0.026570	0.046857	-0.030693	0.059334
South	0.050610	0.039284	0.059603	0.043602
Located in an industrial district and belongs to the same industry of the district	0.000796	0.022758	-0.022157	0.027649
Located in an industrial district but not necessarily belongs to the same industry of the district	0.032640	0.020248	0.024480	0.022659
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	-0.023542	0.019015	-0.018699	0.020956
Located in an industrial district and belongs to the machinery manufacturing industry	0.016338	0.036584	0.028730	0.041234
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	-0.102139	0.064220	-0.050803	0.072868
<i>Observations</i>	6238		6235	
<i>F-test, F-statistic</i>	9.22***		7.34***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one process innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 5 – Determinants of product innovation

	OLS		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.138771**	0.060395	0.834555	0.977876
Branches	-0.124294	0.076370	-0.056906	0.103661
Herfindahl	-0.155258	0.253456	-0.353030	0.336213
Leverage	0.115188**	0.051636	0.137960**	0.057514
Major owner	0.063547***	0.022539	0.081105***	0.028418
Listed company	0.077198	0.058852	0.087202	0.062750
Innovative financial instruments	0.103683***	0.027493	0.118687***	0.032041
Minority shares underwritten by financial operators	0.050520	0.054254	0.022578	0.061436
Minority shares underwritten by non-financial private operators	0.269589***	0.051484	0.299240***	0.058979
Credit consortium	0.088732***	0.033425	0.088208***	0.033943
Export consortium	0.217739***	0.043516	0.198957***	0.048603
Research consortium	-0.050102	0.079348	-0.037995	0.080546
Corporation	0.022853	0.028988	0.024435	0.029689
Group	-0.017566	0.015927	-0.001675	0.022409
Age	0.019818*	0.010955	-0.071975	0.092972
Size	0.058171***	0.007110	0.054782***	0.008001
International competitors	0.139497***	0.013379	0.142484***	0.014015
ISO9000 certified	0.022039*	0.012558	0.023987*	0.013033
Judicial inefficiency	-0.006990	0.007004	-0.006291	0.007237
Social Capital	0.509388**	0.209201	0.376070	0.250558
Per capita value added	-0.030766	0.042576	-0.053282	0.050240
South	-0.017793	0.034788	-0.014945	0.035716
Located in an industrial district and belongs to the same industry of the district	0.007144	0.021392	-0.002682	0.024051
Located in an industrial district but not necessarily belongs to the same industry of the district	0.001392	0.018493	-0.002684	0.019167
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	-0.004340	0.017631	-0.001478	0.018078
Located in an industrial district and belongs to the machinery manufacturing industry	0.053871	0.035066	0.058483	0.036464
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.079454	0.062919	0.101271	0.068254
<i>Observations</i>	6238		6235	
<i>F-test, F-statistic</i>	25.15***		23.56***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one product innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 6 – Determinants of product innovation (with filtering)

	OLS		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.114676*	0.059562	2.057065**	0.982923
Branches	-0.013123	0.075483	0.135704	0.109286
Herfindahl	-0.170043	0.241249	-0.632664*	0.347069
Leverage	0.086177*	0.050907	0.134686**	0.061521
Major owner	0.054373**	0.022183	0.092606***	0.030108
Listed company	0.091141	0.060213	0.099047	0.068664
Innovative financial instruments	0.086057***	0.027916	0.118968***	0.034740
Minority shares underwritten by financial operators	0.023757	0.056338	-0.039233	0.065074
Minority shares underwritten by non-financial private operators	0.238482***	0.054534	0.311578***	0.065794
Credit consortium	0.098717***	0.033899	0.099018***	0.037153
Export consortium	0.226093***	0.044883	0.185627***	0.054105
Research consortium	-0.047499	0.081209	-0.008454	0.090523
Corporation	0.029325	0.027602	0.034078	0.031839
Group	-0.022362	0.015793	0.010936	0.023168
Age	0.014698	0.010961	-0.192048**	0.094033
Size	0.056188***	0.007247	0.049396***	0.008723
International competitors	0.137472***	0.013330	0.142165***	0.015091
ISO9000 certified	0.021018*	0.012376	0.026282*	0.014071
Judicial inefficiency	-0.003187	0.006862	-0.000912	0.007725
Social Capital	0.354432*	0.202853	0.063839	0.265582
Per capita value added	-0.024097	0.041930	-0.073160	0.053353
South	-0.021173	0.033453	-0.012561	0.037643
Located in an industrial district and belongs to the same industry of the district	-0.016812	0.021365	-0.038608	0.026036
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.000703	0.018264	-0.008971	0.020322
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	5.71E-05	0.017605	0.004548	0.019359
Located in an industrial district and belongs to the machinery manufacturing industry	0.051462	0.035603	0.061206	0.039967
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.106254	0.064840	0.157484**	0.074828
<i>Observations</i>	6062		6059	
<i>F-test, F-statistic</i>	17.38***		13.57***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one product innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. Filtering criterion: product innovations associated with a share of sales due to innovative products equal to 0 percent have been set equal to 0. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso et al., 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 7 – Determinants of R&D investment

	OLS		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.058357	0.058591	0.761076	0.991348
Branches	-0.082659	0.074761	-0.021853	0.101711
Herfindahl	0.197423	0.270660	0.032269	0.348329
Leverage	0.036276	0.052042	0.056623	0.057476
Major owner	0.016455	0.022230	0.030582	0.028130
Listed company	-0.027651	0.052754	-0.019505	0.055981
Innovative financial instruments	0.080491***	0.027361	0.093032***	0.031736
Minority shares underwritten by financial operators	0.021223	0.047424	-0.003191	0.056647
Minority shares underwritten by non-financial private operators	0.227308***	0.042761	0.251562***	0.051904
Credit consortium	0.124804***	0.031992	0.124466***	0.032726
Export consortium	0.204755***	0.044195	0.189756***	0.047374
Research consortium	0.110103*	0.060332	0.119821*	0.061235
Corporation	0.128308***	0.027819	0.129719***	0.028160
Group	0.018890	0.016290	0.032126	0.022543
Age	0.019156*	0.010465	-0.058638	0.094392
Size	0.108097***	0.006879	0.105660***	0.007620
International competitors	0.136016***	0.013535	0.138223***	0.014008
ISO9000 certified	0.071548***	0.012746	0.073142***	0.013021
Judicial inefficiency	-0.004651	0.007103	-0.003895	0.007256
Social Capital	0.217381	0.211726	0.104820	0.253192
Per capita value added	0.009115	0.043262	-0.010891	0.050472
South	-0.090529***	0.035054	-0.087148**	0.035624
Located in an industrial district and belongs to the same industry of the district	0.020091	0.021533	0.012093	0.023948
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.015512	0.018292	-0.019357	0.019021
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0.013903	0.017483	0.016012	0.017949
Located in an industrial district and belongs to the machinery manufacturing industry	0.098338***	0.034376	0.102578***	0.035818
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	-0.032000	0.060292	-0.012381	0.064790
<i>Observations</i>	6235		6232	
<i>F-test, F-statistic</i>	50.12***		48.02***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have realized R&D investment in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 8 – Determinants of high R&D intensity

	OLS		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.004595	0.100338	3.241204**	1.534220
Branches	-0.185078	0.129800	0.022742	0.183887
Herfindahl	-0.514067	0.560880	-2.300763**	1.110806
Leverage	-0.157881	0.097786	-0.140375	0.124304
Major owner	-0.064421	0.042223	-0.003754	0.060825
Listed company	0.184032*	0.097400	0.337503***	0.127744
Innovative financial instruments	-0.011398	0.045440	0.058240	0.062148
Minority shares underwritten by financial operators	0.012833	0.086524	-0.154010	0.139148
Minority shares underwritten by non-financial private operators	0.146009*	0.077180	0.256452**	0.107905
Credit consortium	0.074747	0.059380	0.061342	0.071373
Export consortium	0.095096	0.062941	-0.003271	0.088795
Research consortium	0.233834**	0.097615	0.206192*	0.110153
Corporation	0.029946	0.065571	0.048029	0.083297
Group	0.023466	0.027438	0.105238*	0.055979
Age	-0.006743	0.019991	-0.301089**	0.141594
Size	-0.031234**	0.012516	-0.064738***	0.023753
International competitors	0.048348**	0.023201	0.076634**	0.033366
ISO9000 certified	-0.070991***	0.025314	-0.068504**	0.031482
Judicial inefficiency	-0.002470	0.014254	0.002382	0.017768
Social Capital	0.632285	0.393434	0.475185	0.491774
Per capita value added	-0.179845**	0.083903	-0.382461***	0.142519
South	-0.149214**	0.073029	-0.150604	0.095567
Located in an industrial district and belongs to the same industry of the district	-0.072867*	0.040983	-0.080410	0.050405
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.039215	0.036919	-0.045174	0.045737
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	-0.054913	0.033903	-0.032093	0.043535
Located in an industrial district and belongs to the machinery manufacturing industry	0.062954	0.056821	0.090832	0.072125
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.006206	0.086697	0.057224	0.085881
<i>Observations</i>	1843		1842	
<i>F-test, F-statistic</i>	11.90***		7.00***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have realized R&D investment with an R&D intensity greater than 1 percent in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 9 – Determinants of innovation: analysis of robustness after controlling for financial development or number of banks

	IV		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	2.169974*	1.271532	1.887582*	1.128380
Financial development	0.024964	0.138172		
Number of banks			0.212781	0.240058
Branches	0.145642	0.118543	0.074210	0.142793
Herfindahl	-0.268885	0.439238	0.061411	0.546052
Leverage	0.223576***	0.068839	0.135046	0.120004
Major owner	0.041254	0.034754	0.049300	0.034347
Listed company	0.080802	0.070078	0.075530	0.069027
Innovative financial instruments	0.126627***	0.036677	0.078674	0.063886
Minority shares underwritten by financial operators	-0.003650	0.064382	-0.005732	0.062359
Minority shares underwritten by non-financial private operators	0.277514***	0.061206	0.254103***	0.066802
Credit consortium	0.093012**	0.037154	0.070757	0.044534
Export consortium	0.121050**	0.051763	0.100169*	0.058101
Research consortium	0.048404	0.074999	0.041002	0.069327
Corporation	0.081599**	0.037349	0.048581	0.050191
Group	0.016322	0.027016	0.010498	0.025520
Age	-0.189591	0.120817	-0.169780	0.105737
Size	0.070468***	0.009467	0.023359	0.053780
International competitors	0.126075***	0.015730	0.120585***	0.016333
ISO9000 certified	0.037681**	0.015514	0.014311	0.029879
Judicial inefficiency	-0.004751	0.008472	-0.007197	0.008823
Social Capital	0.009211	0.384910	-0.288677	0.480665
Per capita value added	-0.054110	0.064625	0.008975	0.091742
South	0.035050	0.043584	0.021665	0.045666
Located in an industrial district and belongs to the same industry of the district	-0.030268	0.028427	-0.023745	0.028126
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.007160	0.022717	-0.001676	0.023280
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0.006062	0.020711	-0.001642	0.022262
Located in an industrial district and belongs to the machinery manufacturing industry	0.067406*	0.040522	0.062338	0.040161
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.061696	0.071766	0.054960	0.069578
<i>Observations</i>	6235		6220	
<i>F-test, F-statistic</i>	13.57***		13.88***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one (process or product) innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 10 – Determinants of process innovation: analysis of robustness after controlling for financial development or number of banks

	IV		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	1.819228	1.241658	2.227052*	1.154553
Financial development	-0.093453	0.136157		
Number of banks			-0.011974	0.246631
Branches	0.246688**	0.115056	0.253378*	0.144869
Herfindahl	-0.184787	0.426191	-0.316337	0.555512
Leverage	0.181238***	0.066807	0.194503	0.121721
Major owner	-0.004341	0.033934	0.003017	0.035312
Listed company	0.066784	0.076704	0.075485	0.079540
Innovative financial instruments	0.129645***	0.038009	0.140324**	0.066842
Minority shares underwritten by financial operators	-0.031632	0.070800	-0.051008	0.071231
Minority shares underwritten by non-financial private operators	0.101111	0.072286	0.115783	0.077127
Credit consortium	0.052213	0.038169	0.052477	0.047065
Export consortium	0.096096*	0.052190	0.091045	0.058572
Research consortium	0.082500	0.088816	0.083707	0.093082
Corporation	0.051371	0.036258	0.053346	0.052181
Group	0.027085	0.026500	0.033806	0.026032
Age	-0.158528	0.118154	-0.196379*	0.108467
Size	0.074237***	0.009342	0.074416	0.055344
International competitors	0.083027***	0.015426	0.083548***	0.016780
ISO9000 certified	0.029174*	0.015156	0.030777	0.030780
Judicial inefficiency	-0.004992	0.374520	-0.162958	0.492150
Social Capital	0.004336	0.008279	0.005104	0.008879
Per capita value added	-0.014815	0.062559	-0.037552	0.093525
South	0.059694	0.042522	0.058443	0.046327
Located in an industrial district and belongs to the same industry of the district	-0.018189	0.027741	-0.022197	0.028597
Located in an industrial district but not necessarily belongs to the same industry of the district	0.026275	0.022282	0.022992	0.023763
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	-0.018359	0.020479	-0.018199	0.022981
Located in an industrial district and belongs to the machinery manufacturing industry	0.026541	0.040337	0.030131	0.042057
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	-0.059239	0.072533	-0.049686	0.073234
<i>Observations</i>	6235		6220	
<i>F-test, F-statistic</i>	7.67***		6.98***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one process innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 11 – Determinants of product innovation (with filtering): analysis of robustness after controlling for financial development or number of banks

	IV		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	2.094776*	1.106507	1.957541**	0.994781
Financial development	0.010289	0.126965		
Number of banks			-0.005846	0.216093
Branches	0.135705	0.109677	0.133870	0.130250
Herfindahl	-0.642992*	0.373699	-0.620965	0.485880
Leverage	0.135367**	0.062492	0.133951	0.105581
Major owner	0.093227***	0.031450	0.089276***	0.030851
Listed company	0.099238	0.068954	0.099172	0.068054
Innovative financial instruments	0.119641***	0.036157	0.119047**	0.059436
Minority shares underwritten by financial operators	-0.040323	0.066840	-0.035378	0.064348
Minority shares underwritten by non-financial private operators	0.312750***	0.067780	0.308881***	0.069570
Credit consortium	0.098867***	0.037322	0.099408**	0.043698
Export consortium	0.185063***	0.054917	0.187759***	0.057271
Research consortium	-0.007590	0.091438	0.015294	0.089856
Corporation	0.034281	0.032179	0.034262	0.044728
Group	0.011534	0.024534	0.009745	0.023327
Age	-0.195677*	0.106001	-0.183013*	0.093758
Size	0.049225***	0.009002	0.050464	0.049277
International competitors	0.142194***	0.015163	0.141441***	0.015350
ISO9000 certified	0.026425*	0.014264	0.026925	0.026199
Judicial inefficiency	-0.000822	0.007868	-0.001106	0.007912
Social Capital	0.046359	0.349031	0.097556	0.434106
Per capita value added	-0.074857	0.057720	-0.076243	0.082661
South	-0.012567	0.037790	-0.011497	0.040295
Located in an industrial district and belongs to the same industry of the district	-0.039043	0.026770	-0.038269	0.026208
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.009167	0.020548	-0.010057	0.020806
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0.004490	0.019437	0.004601	0.020671
Located in an industrial district and belongs to the machinery manufacturing industry	0.061405	0.040224	0.062231	0.039880
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.158464**	0.076247	0.154756**	0.074318
<i>Observations</i>	6059		6045	
<i>F-test, F-statistic</i>	13.19***		13.53***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one product innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. Filtering criterion: product innovations associated with a share of sales due to innovative products equal to 0 percent have been set equal to 0. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 12 – Determinants of high R&D intensity: analysis of robustness after controlling for financial development or number of banks

	IV		IV	
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	3.661268**	1.666830	3.004850*	1.562707
Financial development	0.370273	0.282529		
Number of banks			0.380932	0.397186
Branches	-0.038103	0.199691	-0.108839	0.231464
Herfindahl	-2.567085**	1.187874	-1.772960	1.376134
Leverage	-0.156213	0.131797	-0.363756	0.270056
Major owner	0.006018	0.064572	0.039112	0.075337
Listed company	0.360173***	0.134267	0.292149*	0.149181
Innovative financial instruments	0.068390	0.065876	-0.013927	0.098458
Minority shares underwritten by financial operators	-0.171125	0.148065	-0.099703	0.152408
Minority shares underwritten by non-financial private operators	0.268299**	0.114213	0.250677**	0.114425
Credit consortium	0.050213	0.074593	0.001360	0.095373
Export consortium	-0.007454	0.094859	-0.025275	0.094977
Research consortium	0.212743*	0.114340	0.175779	0.131968
Corporation	0.056495	0.088142	0.006790	0.094741
Group	0.115949*	0.060687	0.079021	0.058322
Age	-0.339510**	0.153825	-0.307015**	0.146909
Size	-0.071887***	0.026036	-0.142245*	0.084981
International competitors	0.078707**	0.035499	0.075497**	0.034166
ISO9000 certified	-0.065677**	0.033172	-0.098708**	0.043080
Judicial inefficiency	0.004697	0.018593	-0.002310	0.020025
Social Capital	0.007637	0.621051	-0.176225	0.831680
Per capita value added	-0.432024***	0.152898	-0.278527	0.190324
South	-0.155964	0.101541	-0.215254*	0.112706
Located in an industrial district and belongs to the same industry of the district	-0.082924	0.052692	-0.029124	0.071806
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.050131	0.048058	-0.084107	0.063210
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	-0.031790	0.045436	-0.039128	0.045058
Located in an industrial district and belongs to the machinery manufacturing industry	0.099686	0.075930	0.108913	0.074201
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.068226	0.088799	0.028741	0.090337
<i>Observations</i>	1842		1835	
<i>F-test, F-statistic</i>	6.15***		5.89***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have realized an R&D intensity greater than 1 percent in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 13 – Determinants of innovation and high R&D intensity: interaction of relationship length with industrial districts and the machinery manufacturing for the made-in-Italy industry

	Innovation		High R&D intensity	
		IV		IV
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	1.979654*	1.140469	3.216346**	1.490820
Relationship length × located in an industrial district and belongs to the machinery manufacturing industry	0.329673	0.230598	0.023394	0.374624
Relationship length × located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.479857	0.519955	0.465597	0.595015
Branches	0.140591	0.116638	-0.002574	0.183905
Herfindahl	-0.231225	0.409162	-2.174770**	1.108587
Leverage	0.221873***	0.067326	-0.157310	0.124537
Major owner	0.039425	0.033314	-0.000588	0.060814
Listed company	0.082212	0.068534	0.350297***	0.126444
Innovative financial instruments	0.125067***	0.035212	0.060488	0.062282
Minority shares underwritten by financial operators	0.000913	0.061718	-0.161402	0.136534
Minority shares underwritten by non-financial private operators	0.272262***	0.058293	0.257485**	0.108075
Credit consortium	0.094323***	0.036499	0.062880	0.070969
Export consortium	0.122174**	0.051047	-0.003991	0.089377
Research consortium	0.046972	0.074396	0.201445*	0.111599
Corporation	0.078898**	0.036517	0.030953	0.082571
Group	0.012931	0.025328	0.102819*	0.054986
Age	-0.173958	0.108406	-0.298683**	0.138588
Size	0.071033***	0.009008	-0.065873***	0.023387
International competitors	0.126490***	0.015513	0.083566**	0.032765
ISO9000 certified	0.037138**	0.015256	-0.067096**	0.031506
Judicial inefficiency	-0.005228	0.008286	-0.001746	0.017718
Social Capital	0.046779	0.293441	0.157387	0.468305
Per capita value added	-0.045614	0.057614	-0.345318**	0.141599
South	0.036240	0.042953	-0.161893*	0.095153
<i>Observations</i>	6235		1842	
<i>F-test, F-statistic</i>	15.24***		7.10***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one (process or product) innovation or to have realized an R&D intensity greater than 1 percent in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.

TABLE 14 – Determinants of process and product (with filtering) innovation: interaction of relationship length with industrial districts and the machinery manufacturing for the made-in-Italy industry

	Process innovation		Product innovation	
		IV		IV
	Coefficient	s.e.	Coefficient	s.e.
Relationship length	2.140226*	1.153934	2.080643**	1.005072
Relationship length × located in an industrial district and belongs to the machinery manufacturing industry	0.219571	0.239442	0.257259	0.236855
Relationship length × located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	-0.349046	0.518711	1.188160**	0.596102
Branches	0.243943**	0.117770	0.135671	0.109550
Herfindahl	-0.272038	0.412755	-0.644353*	0.350523
Leverage	0.187817***	0.067930	0.138786**	0.062006
Major owner	0.001344	0.033826	0.094254***	0.030574
Listed company	0.070671	0.078838	0.103954	0.069568
Innovative financial instruments	0.135322***	0.038012	0.121315***	0.035033
Minority shares underwritten by financial operators	-0.039437	0.071037	-0.041397	0.065581
Minority shares underwritten by non-financial private operators	0.111681	0.072084	0.312120***	0.066133
Credit consortium	0.050824	0.039210	0.099901***	0.037363
Export consortium	0.089320*	0.052827	0.182323***	0.055497
Research consortium	0.087723	0.088653	-0.004988	0.090047
Corporation	0.051953	0.037199	0.031855	0.031895
Group	0.031663	0.025741	0.010744	0.023516
Age	-0.190227*	0.109815	-0.196848**	0.096249
Size	0.072484***	0.009273	0.049168***	0.008796
International competitors	0.083781***	0.015854	0.143279***	0.015223
ISO9000 certified	0.030112*	0.015483	0.026891*	0.014198
Judicial inefficiency	0.004460	0.008336	-0.001088	0.007704
Social Capital	-0.094044	0.297519	0.024251	0.271868
Per capita value added	-0.034673	0.057866	-0.067104	0.052532
South	0.063549	0.043527	-0.010427	0.037775
<i>Observations</i>	6235		6059	
<i>F-test, F-statistic</i>	7.80***		14.09***	

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have introduced at least one process or to have introduced at least one product innovation in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. Filtering criterion: product innovations associated with a share of sales due to innovative products equal to 0 percent have been set equal to 0. For the definition and source of the variables see table 1. IV uses as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2005). All regressions include constant, industry and time dummies. Robust standard errors are reported in brackets. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. The table also reports, as goodness-of-fit test, the F-statistic for an F-test.